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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/634,379 | 08/05/2003 | James L. Deming | 18195.42 | 8153 |

49358 7590 08/22/2006

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| EXAMINER | |
|---|---|
| WASHBURN, DANIEL C | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2628 | |

DATE MAILED: 08/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/634,379 | DEMING, JAMES L. | |
| | Examiner | Art Unit | |
| | Dan Washburn | 2628 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *05 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-20 and 22-24* is/are rejected.

7)☒ Claim(s) *4 and 21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 101*

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 8-17 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 8-10 read on an abstract idea, as initially defined in claim 8. For example, claim 8 describes a data table comprising a plurality of entries, but claim 8 does not describe the practical application associated with the data table. Therefore the claim is directed solely at an abstract idea and does not produce a useful result.

For claims including such excluded subject matter to be eligible, the claim must be for a practical application of the abstract idea, law of nature, or natural phenomenon. Diehr, 450 U.S. at 187, 209 USPQ at 8 ("application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection."); Benson, 409 U.S. at 71, 175 USPQ at 676 (rejecting formula claim because it "has no substantial practical application").

To satisfy section 101 requirements, the claim must be for a practical application of the § 101 judicial exception, which can be identified in various ways:

- The claimed invention "transforms" an article or physical object to a different state or thing.
- The claimed invention otherwise produces a useful, concrete and tangible result.

Claims 11-17 are directed to non-statutory subject matter because page 22 paragraph 0073 of the applicant's specification describes that the term machine-readable data storage media, which is considered to include computer readable media, refers to any suitable data storage media including digital and analog transmission media. Transmission media, such the applicant's described signal-bearing media, are not considered to fall into one of the four statutory classes of invention, and are therefore considered non-statutory.

Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in § 101.

First, a claimed signal is clearly not a "process" under § 101 because it is not a series of steps. The other three § 101 classes of machine, compositions of matter and manufactures "relate to structural entities and can be grouped as 'product' claims in order to contrast them with process claims." 1 D. Chisum, Patents § 1.02 (1994). The three product classes have traditionally required physical structure or material.

"The term machine includes every mechanical device or combination of mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result." Corning v. Burden, 56 U.S. (15 How.) 252, 267 (1854). A modern definition of machine would no doubt include electronic

devices which perform functions. Indeed, devices such as flip-flops and computers are referred to in computer science as sequential machines. A claimed signal has no physical structure, does not itself perform any useful, concrete and tangible result and, thus, does not fit within the definition of a machine

A "composition of matter" "covers all compositions of two or more substances and includes all composite articles, whether they be results of chemical union, or of mechanical mixture, or whether they be gases, fluids, powders or solids." Shell Development Co. v. Watson, 149 F. Supp. 279, 280, 113 USPQ 265, 266 (D.D.C. 1957), aff'd, 252 F.2d 861, 116 USPQ 428 (D.C. Cir. 1958). A claimed signal is not matter, but a form of energy, and therefore is not a composition of matter.

The Supreme Court has read the term "manufacture" in accordance with its dictionary definition to mean "the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery." Diamond v. Chakrabarty, 447 U.S. 303, 308, 206 USPQ 193, 196-97 (1980) (quoting American Fruit Growers, Inc. v. Brogdex Co., 283 U.S. 1, 11, 8 USPQ 131, 133 (1931), which, in turn, quotes the Century Dictionary). Other courts have applied similar definitions. See American Disappearing Bed Co. v. Arnaelsteen, 182 F. 324, 325 (9th Cir. 1910), cert. denied, 220 U.S. 622 (1911). These definitions require physical substance, which a claimed signal does not have. Congress can be presumed to be aware of an administrative or judicial interpretation of a statute and to adopt that interpretation when it re-enacts a statute without change. Lorillard v. Pons, 434 U.S. 575, 580 (1978). Thus, Congress must be presumed to have been

aware of the interpretation of manufacture in American Fruit Growers when it passed the 1952 Patent Act.

A manufacture is also defined as the residual class of product. 1 Chisum, § 1.02[3] (citing W. Robinson, The Law of Patents for Useful Inventions 270 (1890)).

A product is a tangible physical article or object, some form of matter, which a signal is not. That the other two product classes, machine and composition of matter, require physical matter is evidence that a manufacture was also intended to require physical matter. A signal, a form of energy, does not fall within either of the two definitions of manufacture. Thus, a signal does not fall within one of the four statutory classes of § 101.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5-13, 15-20, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sfarti (US 5,528,737) in view of Thrasher et al. (US 6,753,861).

As to claims 1 and 11, Sfarti describes a method and a computer readable medium on which is stored a computer program that rasterizes an image on a display that is divided into a plurality of selected regions, wherein the image is decomposed into one or more convex polygons, each convex polygon defined a plurality of original edges, wherein each original edge is defined by a first vertex and a second vertex, the

method comprising the steps of, and computer program comprising instructions, which when executed by a computing device, performing the steps of: truncating coordinates of the first vertex to a preselected precision, the truncated coordinates of the first vertex defining a first truncated vertex (column 3 lines 40-67 and column 4 lines 1-4 describes a method and apparatus for rasterizing polygons, which allows for faster rasterization of images with fewer undesirable artifacts. Vertices of each polygon are rounded to the center of the nearest pixels, which makes the edge functions used to compute each edge exact. Because the edge functions are exact the rasterizing process isn't subject to accumulated interpolation errors. Column 10 lines 19-28 describes that each vertex can be rounded to whole numbers or whole numbers divided by two, which is considered truncating each vertex); and truncating coordinates of the second vertex to the preselected precision, the truncated coordinates of the second vertex defining a second truncated vertex (column 10 lines 19-28 describes that each of the three vertices A, B, and C (see Figure 6) are truncated to a whole number or a whole number divided by 2). Sfarti doesn't describe generating coordinates for a first modified vertex by adjusting the first truncated vertex according to characteristics of the original edge; generating coordinates for a second modified vertex by adjusting the second truncated vertex according to the characteristics of the original edge, wherein the first modified vertex and the second modified vertex defining a modified edge for each original edge; and if a first selected region intersects a second region defined by the modified edges, then refreshing the first selected region on the display.

However, Thrasher describes a system and method of generating a line on a display device using region-based rasterization that includes a bounding box to define the region that requires rasterizing (column 2 lines 18-50). Thrasher specifically describes that when a straight line segment 205 (see Figure 2) is drawn in screen space 115, the straight line segment 205 has a first end point P1, at coordinate (X1, Y1), and a second end point P2, at coordinate (X2, Y2). A bounding box 210, which identifies the extent of the screen 110 region that is of concern in displaying the straight line segment 205 is conceptually defined on the screen space 115 by the first and second end points P1, P2, wherein the bounding box has first and second corners 215, 220. Corner 215 of the bounding box is defined by the coordinates (min(X1, X2), min(Y1, Y2)) and corner 220 is defined by (max(X1, X2), max(Y1, Y2)). The area of the display that is refreshed, or rasterized, is the area that falls within the bounding box defined by the corners 215, 220 (column 4 lines 61-67 and column 5 lines 1-14). Thrasher further includes that the corners 215, 220 of the bounding box may be at the same coordinates as the two endpoints P1, P2 of the line, or the corners 215, 220 may be opposite the coordinates of the two endpoints P1, P2, if the slope of the line is negative (column 5 lines 15-26). Therefore, the system and method include: generating coordinates for a first modified vertex by adjusting the first truncated vertex according to characteristics of the original edge (corner 215 of Figure 2 is considered a first modified vertex that is generated according to the characteristics of the original edge (e.g., corner 215 is defined by the minimum of the two X coordinates and the minimum of the two Y coordinates of the original line. The generated coordinates may be the same as one of the two endpoints

of the line, but they may also be a new point that is not one of the two endpoints, which is considered adjusting the first vertex according to characteristics of the original edge)); generating coordinates for a second modified vertex by adjusting the second truncated vertex according to the characteristics of the original edge (e.g., corner 220 is defined by the maximum of the two X coordinates and the maximum of the two Y coordinates of the original line. The generated coordinates may be the same as one of the two endpoints of the line, but they may also be a new point that is not one of the two endpoints, which is considered adjusting the second vertex according to characteristics of the original edge)), wherein the first modified vertex and the second modified vertex defining a modified edge for each original edge (Figure 2 illustrates that the first modified vertex and the second modified vertex (corners 215, 220) define at least one modified edge for each original edge, in this case the two vertices define four modified edges, the edges that make up the bounding box); and if a first selected region intersects a second region defined by the modified edges, then refreshing the first selected region on the display (column 5 lines 27-37 describes that the bounding box, as illustrated in Figure 2, is used to determine which of the screen regions 125 will be activated (or refreshed) in displaying the straight line segment 205 on screen 110 of the monitor 105. Any region of the display that intersects the region defined by the bounding box (which is defined by the modified edges) will be activated, which is considered the same as being refreshed). It would have been obvious to one of ordinary skill in the art at the time of the invention to include in Sfarti the system and method of generating coordinates for a first modified vertex by adjusting the first

truncated vertex according to characteristics of the original edge; generating coordinates for a second modified vertex by adjusting the second truncated vertex according to the characteristics of the original edge, wherein the first modified vertex and the second modified vertex defining a modified edge for each original edge; and if a first selected region intersects a second region defined by the modified edges, then refreshing the first selected region on the display, as taught by Thrasher, in order to create a system that first truncates coordinates of vertices to a preselected precision in order to store and manipulate these coordinates using less bits of information, and then generates a bounding box around each edge, so that only the portions of the display that immediately surround each edge are refreshed. The advantage of only refreshing the portions of the display that include the line segments that make up the polygon is that the system spends less time needlessly refreshing the entire display, which allows the processor to devote more time and computing resources to other system tasks, which results in a valuable increase in system performance.

Regarding claims 2, 12, and 19, Sfarti describes a method, computer readable medium, and system further comprising the steps of: receiving the coordinates for the first vertex of an original edge; and receiving the coordinates for the second vertex of the original edge (column 4 lines 55-67 describes that the system accesses a collection of object descriptions when determining the images to be rendered to the display. The source of the object descriptions could be from a disk, a mouse, a keyboard, or some other input means. Column 5 lines 64-67 and column 6 lines 1-5 describes that the CPU 30 reads the object descriptions and converts the descriptions to image

coordinates if necessary. The user inputting object descriptions and the system interpreting and converting these object descriptions to image coordinates as necessary is considered the system receiving the coordinates for the first and second vertices of an original image).

Concerning claims 3, 13, and 20, Sfarti describes a method, computer readable medium, and system further comprising the step of eliminating a fractional part of the coordinates of the first vertex (column 10 lines 19-28 describes that each of the first, second, and third vertices A, B, and C are rounded to the center of the pixel that each vertex currently occupies. The rounding process truncates the vertices down to whole numbers or whole numbers divided by two).

With regard to claims 5, 15, and 22, Sfarti doesn't describe a method, computer readable medium, or system wherein the step of generating coordinates for a first modified vertex further comprises the steps of: retrieving a first pair of values from a table; and adding the first pair of values to the truncated coordinates of the first vertex.

However, Thrasher describes a method, computer readable medium, and system wherein the step of generating coordinates for a first modified vertex further comprises the steps of: retrieving a first pair of values from a table (column 4 lines 61-67 and column 5 lines 1-14 describes that the first and second corners of the bounding box (corners 215, 220) are defined by the minimum and maximum of the two endpoints of the line being drawn, respectively. The system accessing the coordinates of the two endpoints to determine the minimum and maximum X and Y values is considered the

system retrieving a first pair of values from a table for each modified vertex). See the rejection of claims 1 and 11 for motivation to combine Sfarti with Thrasher.

Sfarti in view of Thrasher doesn't describe adding the first pair of retrieved values to the truncated coordinates of the first vertex; instead Thrasher describes pulling the values directly from the coordinates of the two endpoints. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Sfarti in view of Thrasher the system and method of adding or subtracting a value from the X or Y coordinate of one of the endpoints, rather than combining the minimum or maximum X and Y values, to create the modified vertices of the bounding box. The advantage of retrieving the original endpoints for the line and then shifting the endpoints as needed rather than determining the minimum or maximum X and Y values is that half the time the system will not have to do any work, as the endpoints will be the same as the modified vertices of the bounding box, and the other half of the time the system will simply have to shift either the X coordinate or the Y coordinate in order to define the modified vertices of the bounding box that are opposite the endpoints of the line. This process involves simple addition and subtraction operations, and thus does not require a large amount of CPU resources, which results in an increase in overall system performance when compared against the process of determining the maximum and minimum X and Y values of the line and using these values to generate the bounding box.

As to claims 6, 16, and 23, Sfarti describes a method, computer readable medium, and system wherein the convex polygon is a triangle (column 3 lines 40-67

and column 4 lines 1-4 describe a method and apparatus for rasterizing polygons, and triangles in particular).

Regarding claims 7, 17, and 24, Sfarti describes a method, computer readable medium, and system wherein the convex polygon is a convex quad (column 4 lines 11-16 describes that the rasterization process is easily extensible to polygons of more than three sides, which is considered to include convex quads).

Concerning claim 18, Sfarti describes a system for rasterizing on a display a convex polygon with a plurality of original edges, wherein each original edge is defined by two vertices and each original edge derives a modified edge, the modified edge is used to determine whether a selected region of the display intersects the corresponding edge, the system comprising: a controller (CPU 30 of Figure 2 (column 5 lines 14-20)); a rasterizer connected to the controller (graphics accelerator 46 is considered a rasterizer connected to the controller, the graphics accelerator can help out the CPU 30 by reading descriptions of objects from image object memory 40 to generate an image, which is then stored in image memory 42. Once the image is generated it is moved from image memory 42 to display driver 48, which outputs it to one or more display devices (column 5 lines 21-32)); a display interface unit connected to the rasterizer, the display interface unit receiving rasterized data from the rasterizer and transmitting the rasterized data to a display unit (display driver 48 (column 5 lines 29-32)); a storage unit for storing data used during the rasterization process (image memory 42 (column 5 lines 21-32)), wherein the rasterizer unit being capable of rasterizing an image on the display device divided into a plurality of preselected regions, wherein the image is decomposed

into one or more convex polygons, each convex polygon defined a plurality of original edges, wherein each original edge is defined by a first vertex and a second vertex, by executing the steps of: truncating coordinates of the first vertex to a preselected precision, the truncated coordinates of the first vertex defining a first truncated vertex; truncating coordinates of the second vertex to the preselected precision, the truncated coordinates of the second vertex defining a second truncated vertex; generating coordinates for a first modified vertex by adjusting the first truncated vertex according to characteristics of the original edge; generating coordinates for a second modified vertex by adjusting the second truncated vertex according to the characteristics of the original edge, wherein the first modified vertex and the second modified vertex defining a modified edge for each original edge; and if a first selected region intersects a second region defined by the modified edges, then refreshing the first selected region on the display (see the rejection of claims 1 and 11, as it is identical in scope to the limitations just recited).

***Allowable Subject Matter***

Claims 4 and 21 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 14 would be objected to except for the rejection under 35 U.S.C. 101. If the 101 rejection of claim 14 is overcome and it is rewritten in independent form including all of the limitations of the base claim and any intervening claims it would be allowable.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tang et al. (US 6,867,778) describes a polygon rasterization system that receives vertices of a polygon from a user, interpolates the x and y values for each edge of the polygon, and then replaces the interpolated vertices with the original vertices and 'snaps' the edges to the original vertices in order to generate an accurate representation of the original polygon.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Washburn whose telephone number is (571) 272-5551. The examiner can normally be reached on Monday through Friday 8:30 a.m. to 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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8/11/06

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SUPERVISORY PATENT EXAMINER